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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/082,314	02/26/2002	Fumio Isshiki	ASAM.0053	2802

38327 7590 04/16/2008

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EXAMINER	
GIESY, ADAM	

ART UNIT	PAPER NUMBER
2627	

MAIL DATE	DELIVERY MODE
04/16/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/082,314	ISSHIKI, FUMIO	
	Examiner	Art Unit	
	ADAM R. GIESY	2627	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *14 February 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,3-5 and 7-21* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,3-5 and 7-21* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *26 February 2002* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

1. Claim1 and 21 are objected to because of the following informalities:

Examiner asserts that line 1 of claim 1 should be amended to read –An optical head comprising:...-- instead of "An optical head comprising..." in order to more clearly delineate the end of the preamble.

Examiner asserts that line 3 of claim 21 should be amended to read –said at least one barrier layer...-- instead of "Said at least one barrier layer...".

Appropriate correction is required.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1, 3-5, 7-13, 16, and 18-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over MoMoo et al. (hereinafter Momoo – US Pat. No. 6,741,538 B2) in view of Edmond et al. (hereinafter Edmond – 5,592,501) and further in view of Issiki et al. (hereinafter Issiki – Efficient luminescence from AlP/GaP neighboring confinement structure with AlGaP barrier layers).

Regarding claim 1, Momoo discloses an optical head comprising: a light source for emitting a light beam (see Figure 2b, element 204), a lens for focusing the light beam onto a medium (see Figure 2a, element 104), and a detector for detecting a

reflected light beam from the medium (see Figure 2b, element 205). Momoo does not disclose an indirect bandgap semiconductor laser in the optical head.

Edmond discloses an indirect bandgap semiconductor diode that can be used in an optical system as the light source (see column 2, lines 37-44). Edmond does not disclose all of the specifics of the indirect bandgap semiconductor laser element.

Issiki discloses an indirect bandgap semiconductor material that can be used as a high efficiency lighting element wherein the light source comprises a semiconductor laser comprising an active layer and at least one barrier layer, said active layer is formed of an indirect bandgap semiconductor in an asymmetric quantum structure in which a bandgap is defined between a quantum well of a conduction band and an adjacent quantum well of a valence band, and each of the quantum wells has two walls which are asymmetric with respect to a center of the quantum well (see page 1048, Figure 1).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the optical head as disclosed by Momoo with the laser element as disclosed by Edmond and the specifics of the laser element as disclosed by Issiki, the motivation being to utilize an energy efficient medium for use as a light element in a power efficient optical head.

Regarding claim 3, Momoo, Edmond, and Issiki disclose all the limitations of claim 1 as described in the claim 1 rejection above. Issiki further discloses that the semiconductor laser has a barrier layer, which is also said indirect semiconductor (see page 1048, Figure 1, note the $Al_{0.5}Ga_{0.5}P$ barrier layer).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the optical head as disclosed by Moo with the laser element as disclosed by Edmond and the specifics of the laser element as disclosed by Issiki, the motivation being to utilize an energy efficient medium for use as a light element in a power efficient optical head.

Regarding claim 4, Momoo, Edmond, and Issiki disclose all the limitations of claim 1 as described in the claim 1 rejection above. Issiki further discloses that the indirect semiconductor is made of an indirect semiconductor mixed crystal material (see page 1048, column 1, note that the AlP/GaP is a superlattice).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the optical head as disclosed by Moo with the laser element as disclosed by Edmond and the specifics of the laser element as disclosed by Issiki, the motivation being to utilize an energy efficient medium for use as a light element in a power efficient optical head.

Regarding claim 5, Momoo, Edmond, and Issiki disclose all the limitations of claim 1 as described in the claim 1 rejection above. Momoo further discloses that the optical head is used for reproducing information from the medium (see abstract).

Regarding claim 7, Momoo, Edmond, and Issiki disclose all the limitations of claim 1 as described in the claim 1 rejection above. Issiki further discloses that the indirect semiconductor has an adjacent confinement structure (see page 1048, Figure 1).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the optical head as disclosed by Moo with the laser element as disclosed by Edmond and the specifics of the laser element as disclosed by Issiki, the motivation being to utilize an energy efficient medium for use as a light element in a power efficient optical head.

Regarding claim 8, Momoo, Edmond, and Issiki disclose all the limitations of claim 1 as described in the claim 1 rejection above. Issiki further discloses that the material of the indirect semiconductor is of an AlGaP (aluminum, gallium and phosphor) group (see page 1048, Figure 1).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the optical head as disclosed by Moo with the laser element as disclosed by Edmond and the specifics of the laser element as disclosed by Issiki, the motivation being to utilize an energy efficient medium for use as a light element in a power efficient optical head.

Regarding claim 9, Momoo, Edmond, and Issiki disclose all the limitations of claim 1 as described in the claim 1 rejection above. Issiki further discloses that the light beam has a continuous spectrum of which a half-value width of a main peak is not less than 20 meV but not greater than 400 meV in the form of optical energy range (see 1050, Figure 4).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the optical head as disclosed by Moo with the laser element as disclosed by Edmond and the specifics of the laser element as disclosed by

Issiki, the motivation being to utilize an energy efficient medium for use as a light element in a power efficient optical head.

Regarding claim 10, Momoo, Edmond, and Issiki disclose all the limitations of claim 8 as described in the claim 8 rejection above. Issiki further discloses that the light beam has a continuous spectrum of which a half-value width of a main peak is not less than 6 nm but not greater than 100 nm (see 1050, Figure 4).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the optical head as disclosed by Moo with the laser element as disclosed by Edmond and the specifics of the laser element as disclosed by Issiki, the motivation being to utilize an energy efficient medium for use as a light element in a power efficient optical head.

Regarding claim 11, Momoo, Edmond, and Issiki disclose all the limitations of claim 1 as described in the claim 1 rejection above. Issiki further discloses that the material of the indirect semiconductor is of a SiGe (silicon germanium) group (see page 1048, column 1).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the optical head as disclosed by Moo with the laser element as disclosed by Edmond and the specifics of the laser element as disclosed by Issiki, the motivation being to utilize an energy efficient medium for use as a light element in a power efficient optical head.

Regarding claim 12, Momoo, Edmond, and Issiki disclose all the limitations of claim 11 as described in the claim 11 rejection above. Issiki further discloses that the

light beam has a continuous spectrum of which a half-value width of a main peak is not less than 20 meV but not greater than 150 meV in optical energy range (see 1050, Figure 4).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the optical head as disclosed by Moo with the laser element as disclosed by Edmond and the specifics of the laser element as disclosed by Issiki, the motivation being to utilize an energy efficient medium for use as a light element in a power efficient optical head.

Regarding claim 13, Momoo, Edmond, and Issiki disclose all the limitations of claim 11 as described in the claim 11 rejection above. Issiki further discloses that the light beam has a continuous spectrum of which a half-value width of a main peak is not less than 13 nm but not greater than 90 nm at a room temperature (see 1049, Figure 2).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the optical head as disclosed by Moo with the laser element as disclosed by Edmond and the specifics of the laser element as disclosed by Issiki, the motivation being to utilize an energy efficient medium for use as a light element in a power efficient optical head.

Regarding claim 16, Momoo, Edmond, and Issiki disclose all the limitations of claim 1 as described in the claim 1 rejection above. Momoo further discloses a waveband pass filter for limiting the wavelength of the light beam from the semiconductor laser to be less a half-value width of 2 nm (see column 1, lines 46-48).

Regarding claim 18, Momoo, Edmond, and Issiki disclose all the limitations of claim 1 as described in the claim 1 rejection above. Momoo further discloses an optical disc apparatus using an optical head as set forth in claim 1 (see column 17, lines 24-30).

Regarding claim 19, Momoo, Edmond, and Issiki disclose all the limitations of claim 1 as described in the claim 1 rejection above. Issiki further discloses that the half-width of the main peak is in a range from 6 nm to 10 nm (see page 1049, Figure 2).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the optical head as disclosed by Moo with the laser element as disclosed by Edmond and the specifics of the laser element as disclosed by Issiki, the motivation being to utilize an energy efficient medium for use as a light element in a power efficient optical head.

Regarding claim 20, Momoo, Edmond, and Issiki disclose all the limitations of claim 1 as described in the claim 1 rejection above. Issiki further discloses that the active layer is formed of a first layer constituting the quantum well of the conduction band and a second layer constituting the quantum well of the valence band, the first and second layers are made of different materials (see page 1048, Figure 1).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the optical head as disclosed by Moo with the laser element as disclosed by Edmond and the specifics of the laser element as disclosed by Issiki, the motivation being to utilize an energy efficient medium for use as a light element in a power efficient optical head.

Regarding claim 21, Momoo, Edmond, and Issiki disclose all the limitations of claim 20 as described in the claim 20 rejection above. Issiki further discloses that the first layer is made of AlP, the second layer is made of GaP, and said at least one barrier layer includes two barrier layers which are made of AlGaP and sandwich said active layer in-between (see page 1048, Figure 1).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the optical head as disclosed by Moo with the laser element as disclosed by Edmond and the specifics of the laser element as disclosed by Issiki, the motivation being to utilize an energy efficient medium for use as a light element in a power efficient optical head.

4. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over MoMoo et al. (hereinafter Momoo – US Pat. No. 6,741,538 B2) in view of Edmond et al. (hereinafter Edmond – 5,592,501) and further in view of Issiki et al. (hereinafter Issiki – Efficient luminescence from AlP/GaP neighboring confinement structure with AlGaP barrier layers) and even further in view of Yoshida et al. (hereinafter Yoshida – US Doc. No. 2002/0024153 A1).

Regarding claim 14, Momoo, Edmond, and Issiki disclose all the limitations of claim 1 as described in the claim 1 rejection above. Yoshida discloses a laser device that wherein a direct current (dc) drive is used for driving the semiconductor laser (see page 6, paragraph 0061).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the disclosures of Momoo, Edmond, Issiki, and

Yoshida, the motivation being to reduce the energy loss and heat by regulating the DC current to a laser instead of using a circuit to regulate current from an AC source.

5. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over MoMoo et al. (hereinafter Momoo – US Pat. No. 6,741,538 B2) in view of Edmond et al. (hereinafter Edmond – 5,592,501) and further in view of Issiki et al. (hereinafter Issiki – Efficient luminescence from AlP/GaP neighboring confinement structure with AlGaP barrier layers) and even further in view of Hayashi (US Pat. No. 6,394,655 B1).

Regarding claim 15, Momoo, Edmond, and Issiki disclose all the limitations of claim 1 as described in the claim 1 rejection above. Hayashi discloses a multi-layer film reflector provided at an end face of a resonator (see abstract).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the disclosures of Momoo, Edmond, Issiki, and Hayashi, the motivation being to produce a laser with increased transmission speed.

6. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over MoMoo et al. (hereinafter Momoo – US Pat. No. 6,741,538 B2) in view of Edmond et al. (hereinafter Edmond – 5,592,501) and further in view of Issiki et al. (hereinafter Issiki – Efficient luminescence from AlP/GaP neighboring confinement structure with AlGaP barrier layers) and even further in view of Brown (US Pat. No. 5,625,729).

Regarding claim 17, Momoo, Edmond, and Issiki disclose all the limitations of claim 1 as described in the claim 1 rejection above. Brown discloses a cooler for lowering the temperature of a light emitting part of the semiconductor laser (see column 14, lines 20-34).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the disclosures of Momoo, Edmond, Issiki, and Brown, the motivation being to avoid overheating the laser element.

Response to Arguments

7. Applicant's arguments with respect to claim1, 3-5, and 6-19 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to ADAM R. GIESY whose telephone number is (571)272-7555. The examiner can normally be reached on 8:00am- 5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wayne R. Young can be reached on (571) 272-7582. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

ARG 3/25/2008

/Adam R. Giesy/
Examiner, Art Unit 2627

/Wayne R. Young/
Supervisory Patent Examiner, Art Unit 2627